



MAHSA UNIVERSITY
FACULTY OF MEDICINE, BIOSCIENCE AND NURSING
SCHOOL OF BIOSCIENCE

An Assignment Submitted in Partial Fulfilment of the Requirements in Case Study &
Problem Solving (BMC421) for the Degree of Biomedical Sciences (Hons.)

INDIVIDUAL REPORT ON CASE STUDY GROUP 3

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Declaration: I, BBSH 18046019 confirm that I have read and understood the University regulations concerning plagiarism and that the work contained within this assignment is my own work within the meaning of the regulations.

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1.0 Case Study Overview (500 Words)

~~One A~~ male patient ~~aged 53 years old~~ from the emergency department ~~is 53 years old,~~ ~~known as~~ Mr. Andrea, ~~who~~ presented with fever, chills, ~~and~~ cough, and complaining about chest pain. To ~~obtain~~ acquire more information ~~about~~ about him, the physician asked Mr. Andrea ~~a few~~ some questions ~~about~~ regarding his past medical history and background.

~~To~~ In response, ~~answer that,~~ Mr. Andrea ~~told~~ updated the physician ~~regarding his pre-existing conditions of that he had~~ asthma and depression. For his asthma, he ~~notified that took~~ he took fluticasone and albuterol while for his depression, he ~~informed us he was on~~ took sertraline. He also ~~informed~~ apprised us that he had made no contact with any sick person and ~~have had~~ no recent illness. Lastly, he ~~informed~~ explained to us that he was just released from ~~an~~ incarceration ~~for of~~ 2 years.

~~An examination of~~ Mr. Andrea's vital signs ~~examination result shows~~ indicated that he ~~has~~ high body temperature, hyperventilation, high blood pressure, tachycardia and low oxygen saturation.

On ~~an examination of his~~ mental health ~~examination,~~ it was ~~found~~ established out that Mr. Andrea ~~is was~~ notable for orientation but not ~~for~~ place or time.

From the vital signs examination and mental health status, ~~few~~ possible ~~suspected~~ diseases ~~were suspected~~ included such as pneumonia, pulmonary fibrosis, tuberculosis, bronchitis, endocarditis, heart failure and ~~some~~ others. ~~Thus, it is was thus~~ suggested to proceed with a few other tests such as lung examination, ~~and,~~ haematological and biochemical analysis.

~~As a result of the~~ The radiography examination ~~found that~~ his chest x-ray consisted of consolidation, air bronchogram and parapneumonic effusion. ~~For~~ From the lung auscultation, diffuse crackles sound ~~can~~ could be heard.

Based on the haematological analysis, Mr. Andrea's haematocrit result was below the normal range.

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For ~~the~~ biochemical analysis, a renal profile and arterial blood gases (ABG) test was performed. ~~From~~ ~~the~~ renal profile test, ~~it was found-revealed out~~ that sodium level was decreased from as compared to the normal range. Mean-while, random blood glucose level and blood urea nitrogen (BUN) ~~are~~ showed an ~~increasing~~ from ~~the~~ normal range. In contrast, from the ABG test, the pH value was ~~found-discovered out~~ to be acidic. The partial pressure of oxygen is indicated as ~~decreasing~~ from ~~the~~ normal range which ~~indicates~~ showed that. ~~The~~ partial pressure of carbon dioxide is ~~was~~ slightly increased more than from the normal range. The bicarbonate level is ~~was~~ within ~~the~~ range. Overall, the ABG test result showed that Mr. Andrea ~~had~~ has uncompensated respiratory acidosis.

~~From~~ ~~Considering those the~~ results of the aforementioned ~~examination results~~ ~~tests~~, the possible diagnosis was narrowed down to bacterial pneumonia or tuberculosis. ~~So~~ ~~to~~ confirm the bacteria involved, ~~that~~ a microbiological test was ~~performed~~ carried out for. ~~Several~~ possible causative agents which may have caused the diseases such as *Mycoplasma pneumoniae*, *Streptococcus pneumoniae*, *Staphylococcus aureus* and others. ~~To~~ ~~confirmed~~ ~~the bacteria involved~~, ~~the microbiological test was performed~~.

The result of the gram staining is ~~was~~ gram-positive. For the sputum culture on blood agar, mucoid, moist colony and alpha haemolysis agar were grown. ~~Then~~ ~~for~~ the catalase test, ~~the~~ result was negative. ~~Hence~~ ~~Therefore~~, it is ~~was~~ identified ~~ascertained~~ that the bacteria is ~~was~~ *Streptococcus pneumoniae*. ~~This~~ ~~hence~~ showing that Mr. Andrea is ~~was~~ established infected with Community-Acquired Pneumonia (CAP).

(449 words)

2.0 Case History

A 53-year-old male emergency patient referred ~~to~~ as Mr. Andrea ~~had~~ presented with fever, chills, ~~and~~ cough. ~~He was also -and- admitted~~ complaining ~~about~~ of chest pain. The ~~attending~~, the physicians asked him few questions to obtain ~~more~~ further information about his background and past medical history ~~ies~~, such as ~~his medical history~~, the medications he ~~took~~ was on, close contact with ~~other~~ patients, his home surroundings and recent travel. These questions ~~served the purpose of~~ might helping the physicians in identifying the ~~possible~~ patient's diagnosis.

In response, Mr. Andrea ~~told us~~ explained to the doctors that he suffered from asthma and depression. He ~~is~~ was taking fluticasone and albuterol for his asthma, ~~whereas~~ with sertraline to treat his depression. Mr. Andrea also informed ~~that us~~ he had not been in contact with any patients and ~~has~~ had also not been sick recently. Lastly, he ~~told us~~ described how ~~that~~ he had just been released from prison ~~where he had been~~ for 2 years.

3.0 Case Investigation: Vital Sign Examination

Based on Sapra A. *et al.* (2020), vital sign examination can be defined as objective measurements of the important physiological functions of a living organism. It is the first step of clinical evaluations, where the vital signs can give the physicians a degree of ~~derangement~~ deviation from the baseline. ~~Vital sign examination consists of a~~ So, ~~there are~~ few components ~~in vital sign examination~~ such as body temperature, heart rate, blood pressure, respiratory rate and oxygen saturation.

Mr. Andrea's body temperature ~~is~~ was 40.1°C, which ~~is~~ was higher than the normal range ~~that it~~ is supposed to be, ~~the normal range being~~ from 36.0 to 37.0°C. The high body temperature ~~may~~ was an indication of the fever he was having (Geneva *et al.*, 2019). ~~Next~~ Furthermore, Mr. Andrea's heart rate ~~is~~ was counted to be 128 beats per minute. ~~It~~ This, ~~too~~, is much higher than the normal range which is ~~between~~ 60 to 100 beats per minute. Mr.

Andrea ~~had~~ showed signs of tachycardia due to ~~the~~ his high fever; or as side effects of his medication. ~~The~~ Tachycardia ~~might~~ may lead to ~~few~~ complications such as blood clots or heart failure (Prabhavathi, 2014). ~~Mr Andrea~~ The patient's blood pressure ~~is~~ was measured to be 130/80 mmHg. This, again, was ~~which is~~ higher than the normal range, which ~~that is~~ ~~supposed~~ ought to be 120/30

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mmHg. This ~~was an indication~~ ~~es that he had of~~ hypertension, which ~~may could have~~ lead to ~~few~~ difficulties, such as damage in arteries or ~~in the~~ heart (Lin *et al.*, 2016). ~~The next vital sign measured was~~ ~~Then~~, Mr. Andrea's respiratory rate, ~~which was is~~ 32 breaths per minute. ~~This result showed to be~~ ~~It is~~ higher than the normal range, which ~~is must be~~ 12 to 20 breaths per minute. Mr. Andrea ~~thus had has~~ hyperventilation; ~~that this might have been due to~~ ~~might occur due to~~ asthma or ~~it may have been a~~ response to ~~his~~ lung tissue's ~~damage or failure or damages~~. Lastly, Mr. Andrea's oxygen saturation result ~~is showed an~~ 85% on 5L of oxygen. ~~It~~ ~~This~~ is lower than the normal range, which ~~is~~ supposed to be at 95% on 5L of oxygen. ~~The~~ ~~This~~ low oxygen saturation result may ~~have indicated~~ ~~few a number of~~ health complications, ~~such as including~~ lung problems or asthma (Chourpiliadis C *et al.*, 2021). Table 1 summarizes Mr. Andrea's vital sign result.

Vital Sign Examination	Mr Andrea's Result	Normal Range	Indication & Result Interpretation
Body Temperature	40.1°C	36-37°C	Increased; Fever
Respiratory Rate	32 breath/min	12-20 breath/min	Increased; Hyperventilation
Blood Pressure	130/88 mmHg	120/80 mmHg	Increased; Hypertension
Heart Rate	128 beats/min	60-100 beats/min	Increased; Tachycardia
Oxygen Saturation	85% on 5l of O ₂	95% on 5l of O ₂	Decreased; Hypoxemia

Table 1. Summarization of ~~Mr. Andrea's~~ vital sign examination ~~on Mr Andrea~~

4.0 Case Investigation: Mental Health Examination

Next, ~~the~~ mental health examination ~~result~~ was executed since Mr. Andrea had ~~s~~ ~~clarified~~ ~~expressed~~ that he ~~had~~ ~~was~~ ~~suffering~~ ~~from~~ depression. Mental health examination involves general observation and cognitive function test (Norris *et al.*, 2016). ~~So~~ ~~the~~ orientation test, one of the components under the cognitive functioning test, was performed to determine Mr. Andrea's ability to recognize place, time and person. ~~However~~ ~~the~~ result obtained ~~demonstrated~~ that Mr. Andrea, ~~while~~ ~~is~~ notable for ~~the~~ orientation to person, ~~was~~ ~~not~~ ~~notable~~ ~~but~~ ~~not~~ for place or time.

5.0 First Possible Diagnosis

According to the ~~patient's~~ presented symptoms, ~~a few~~ suggested diagnoses associated with the given case scenario are pneumonia, pulmonary fibrosis, tuberculosis, bronchitis, influenza, myocarditis, pulmonary hypertension, pneumothorax, heart failure, meningitis ~~and~~ ~~pericarditis~~ ~~and~~ ~~endocarditis~~.

6.0 Case Investigation: Lung Examination

In lung examination, lung auscultation and chest x-ray were performed. Lung auscultation is one of ~~the~~ assessment ~~methods~~ of the respiratory system. ~~This~~ procedure is usually performed on ~~a~~ patient ~~with~~ ~~breathing~~ ~~problem~~ ~~who~~ ~~has~~ ~~trouble~~ ~~breathing~~. Lung auscultation includes listening to these internal sounds to assess ~~the~~ airflow through the trachea and brachial (Sarkar *et al.*, 2015). In Mr. Andrea's ~~case~~s, the ~~result~~ of ~~his~~ lung auscultation ~~result~~ ~~is~~ ~~was~~ ~~diffused~~ crackles sounds. Crackles sounds occurs when the alveoli in the lungs are filled with fluids. The sounds are lower-pitched and moist-sounding. These usually occur in ~~the~~ patients ~~suffering~~ ~~from~~ ~~of~~ asthma, acute respiratory distress syndrome (ARDS) and early congestive heart failure (Estes *et al.*, 2013).

Mr. Andrea's chest x-ray presented with consolidation, air bronchogram and parapneumonic effusion. Lung consolidation may appear ~~and look~~ as white or opaque in chest x-ray. It can occur due to blood, pus or water, which ~~have taken up space~~ in the alveolar spaces. As a result, it may cause ~~problem in troubled~~ breathing. The consolidation usually occurs with air bronchogram, which can be defined as a gas-filled bronchi surrounded by the alveoli fluid. Lastly is parapneumonic effusion, which refers to the accumulation of exudative pleural fluid. It often associated with lung infections such as pneumonia (Walker *et al.*, 2013).



Figure 1. Consolidation on the left part of the lung.



Figure 2. Air bronchogram on the left part of the lung.



Figure 3. Parapneumonic effusion on the right part of the lung.

7.0 Case Investigation: Haematological Analysis

~~There are few components in~~ the components of the haematological analysis ~~such as~~ include full blood count, coagulation, haematocrit, total platelet count and erythrocyte sedimentation rate test. In ~~the case of the patient Mr. Andrea case~~, the result of the haematocrit ~~result~~ was abnormal, ~~which is At 29.2%.~~ ~~It is was~~ lower than the normal range, which is 38.3 to 48.6%. Haematocrit test ~~is to serves to~~ measure the red blood cells in an individual's blood. Thus, the low level of haematocrit may indicate a disease like anaemia and there is a possibility of a large number of white blood cells due to long-term illness or infection (Cohen *et al.*, 2017).

(2544 words)

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